

5. ENERGY

Table 5-1. Federal Resources in Support of Energy
(Dollar amounts in millions)

Function 270	1993 Actual	2001 Estimate	Percent Change: 1993–2001
Spending:			
Discretionary budget authority	5,832	3,099	¹ –47%
Mandatory outlays	–1,240	–3,636	193%
Credit Activity:			
Direct loan disbursements	1,508	1,916	27%
Guaranteed loans	1	30	NA
Tax expenditures	2,420	2,100	–13%

NA = Not applicable.

¹The decline in discretionary budget authority is largely the result of restructuring accounts in this function since 1993. Selected funding was moved to the General Science, Space, and Technology function and to the National Defense function.

Federal energy programs contribute to energy security, economic prosperity, and environmental protection through a range of activities, from protecting against disruptions in petroleum supplies, to conducting research on renewable energy sources, to cleaning up Department of Energy (DOE) facilities contaminated by years of nuclear-related research activities. In addition to the spending programs, the Federal Government currently allocates about \$2 billion a year in tax benefits, mainly to encourage development of traditional and alternative energy sources.

DOE and Health and Human Services (HHS) also provide grants to States that assist low-income residents with energy: DOE provides grants to States to weatherize low-income homes, and HHS' Low-Income Heating and Energy Assistance Program (LIHEAP) provides grants to help low-income families pay their energy bills and also supplements the home weatherization program. LIHEAP funding, however, is included in the Income Security function. (See Chapter 14.)

Energy efficiency rules are also an important part of the Government's energy program. For example, as a result of appliance efficiency

rules, consumers are saving approximately \$4.6 billion annually in reduced energy costs.

The Federal Government has a longstanding and evolving role in energy. Some programs, such as DOE's Weatherization Assistance Program and HHS' LIHEAP, work with State agencies through block grants. However, most Federal energy programs and agencies have no State or private counterparts and focus on national concerns. The federally-owned Strategic Petroleum Reserve, for instance, protects against supply disruptions and the resulting consumer price shocks, while Federal regulators protect public health and the environment and ensure fair, efficient energy rates. DOE's applied research and development (R&D) programs in fossil, nuclear, solar/renewable energy, and energy conservation speed the development of technologies, frequently through cost-shared partnerships with industry. These are examples of the basic principles that form the framework of the Clinton-Gore Administration's energy policy:

- reliance on competitive markets as the "first principle" of energy policy;
- support for energy science and technology;

- promotion of Government/industry/consumer partnerships;
- use of targeted incentives and regulations to promote positive actions and to help internalize externalities; and,
- facilitation of international cooperation.

The discussion that follows is organized around the following seven themes: applied energy R&D; environmental quality; electricity production and power marketing; petroleum supplies and emergency reserves; energy regulation; DOE corporate management and procurement reform; and, the operation of the Nuclear Regulatory Commission (NRC).

Applied Energy R&D

DOE's energy R&D investments cover a broad array of resources and technologies to make the production and use of all forms of energy—including solar and renewables, fossil, and nuclear—more efficient and less environmentally damaging. These investments reach beyond what the marketplace demands today, enhancing our Nation's energy security, laying the foundation for a more sustainable energy future, and opening major international markets for manufacturers of advanced U.S. technology.

DOE's energy efficiency, renewable energy, and electric energy systems programs, along with elements of the Fossil Energy and Nuclear Energy R&D programs, form a major part of the Administration's Climate Change Technology Initiative, which is intended to find ways to reduce emissions of carbon dioxide and other greenhouse gases in ways that benefit our economy rather than constrain it.

Energy Conservation: DOE's energy conservation programs are designed to improve the fuel economy of various transportation modes, increase the productivity of our most energy-intensive industries, and improve the energy efficiency of buildings and appliances. They also include grants to States to fund energy-efficiency programs and low-income home weatherization. Each of these activities benefits our economy and reduces emissions of carbon dioxide and other greenhouse gases, and many rely on partnerships with the private sector for cost-sharing and commercialization.

During this Administration, funding for energy conservation has risen from \$576 million to \$817 million, a 42-percent increase. A basic societal improvement to which these programs have contributed is that the "energy intensity" of the Nation's economy—the average amount of energy society uses to create a unit of Gross Domestic Product—has decreased by 12 percent since 1992.

DOE supports a broad research portfolio for energy conservation. It is difficult to predict in advance which particular technologies will be the biggest commercial successes, but a study in the mid-1990s showed that just five—heat-reflecting windows, high-efficiency lights, advanced oil-burners, high-efficiency electric motors and compressors, and software for designing energy-efficient buildings—could be proven to have saved consumers over \$15 billion in energy costs at that time, and the cumulative consumer savings from those technologies today are estimated at more than \$30 billion.

In 1994, the Administration worked with the U.S. auto industry to create the Partnership for a New Generation of Vehicles (PNGV) with a goal of creating cars with triple the fuel economy of conventional vehicles by 2004. This past year, all three Detroit automakers demonstrated "hybrid-electric" concept cars capable of offering anywhere from 70 to 80 mpg in a mid-sized five-passenger car. Some PNGV technologies are already in use or will be introduced shortly into production. PNGV has not only enjoyed considerable R&D success, it has also served as a model for Government-industry R&D collaboration and partnership.

Over the last six years, nearly 80 communities joined the Administration's Clean Cities effort, deploying more than 160,000 alternative-fuel vehicles (AFVs) in public and private fleets and building over 4,800 alternative refueling stations. The vehicles, operating on natural gas, ethanol, propane, and electricity, will reduce oil use by an estimated 125 million gallons per year. AFVs in Clean Cities have already reduced criteria pollutant emissions by more than 100,000 tons.

DOE's Federal Energy Management Program reduces energy costs to the Federal Government—the largest power user in the country—by helping other agencies improve their energy efficiency. The Administration implemented the Energy Policy Act of 1992 and met its goal of a 20-percent reduction in energy use per square foot by 2000. More recently, President Clinton signed Executive Order 13123, setting new energy goals for 2010 to reduce energy consumption by 35 percent in Federal office buildings and by 25 percent in Federal labs and industrial facilities, to diminish greenhouse gas emissions by 30 percent, to improve water efficiency, and to increase use of renewable energy technology.

DOE's Office of Industrial Technologies has seen roughly 140 of their technologies commercialized; annual energy savings to the U.S. economy from those is about 170 trillion Btu, with another 90 trillion Btu saved annually from their industry assessment and technology-transfer programs. Major commercial successes include the Advanced Turbine Systems program, which has helped industry develop turbines that are 15 percent more efficient than previous models, have lower emissions, and produce electricity for cogeneration systems at a lower price.

DOE's energy conservation program also provides grants to States to fund weatherization improvements in low-income residents' homes. Those improvements often take advantage of the improved building materials and efficient heating systems developed in the R&D program. Over the past eight years, DOE's weatherization program has weatherized approximately 689,000 low-income homes. Over the estimated 20-year life of those improvements, the occupants will save \$2.1 billion on their energy bills and will cut 4.9 million metric tons of carbon emissions. As noted earlier, LIHEAP also provides grants to States, which assist low-income residents in paying their energy bills and also supplement the DOE weatherization program grants.

Solar and Renewable Resources: DOE's solar and renewable resources programs develop technologies that will help the Nation use its abundant renewable resources such as wind, solar, and biomass to produce low-cost,

clean energy that contributes no net carbon dioxide to the atmosphere. The United States is the world's technology leader in wind energy, with a growing export market and production costs that have fallen dramatically. In addition, photovoltaics are becoming more useful in remote power applications, and new biofuels plants are being constructed.

The 1990s have seen considerable progress in the use and cost-competitiveness of solar and renewable energy. Wind power was the fastest-growing source of electricity in the world, and in the U.S. wind power has dropped in price to less than five cents per kilowatt-hour (kWh) in good wind sites. (The program has set a very ambitious goal of reducing those costs to 2.5 cents per kWh in 10 years.) From 1990 to 1999, the production cost per watt of photovoltaic (PV) panels has dropped by a factor of six, and shipments of PV panels have roughly tripled. The cost of geothermal electricity dropped by one-third between 1990 and 1999, to as little as 3.5 cents per kWh.

The Administration's Million Solar Roofs initiative was established to facilitate the placement of one million solar roof installations (a mixture of solar heat/hot water and photovoltaics) by 2010. DOE has now received commitments from Federal agencies, State, and local governments, and private developers for more than one million solar energy systems, and nearly 100,000 systems have already been installed.

Electric Energy Systems: These programs focus on technical advances in electricity transmission and storage and on the efficiency and reliability of the Nation's electrical grid. The largest activity is in high-temperature superconductivity R&D, which can greatly increase the efficiency of generators and heavy electrical machinery, and which can dramatically increase the carrying capacity of high-voltage transmission lines. The practical fruits of a decade of basic and applied materials research are just emerging. In 1999, for the first time in the world, a high-temperature superconducting cable provided commercial grid electricity to a manufacturing plant—enough electricity to power a small town. This year, DOE will make available “second generation”

high-temperature superconducting wires in continuous lengths.

Hydrogen: Prior to 1993, the only practical technology for extracting hydrogen from raw fuels was large-scale steam reforming, requiring exotic alloys to handle the extreme temperatures and pressures. DOE research in the past eight years has pursued several avenues. Steam reformers aided by catalysts can operate at much lower temperatures, allowing the use of conventional, less expensive alloys and reducing the capital cost of reformers. Progress has also been made in technologies such as plasma reformers and proton-exchange membranes that will allow production of hydrogen on a smaller, more distributed scale—directly at fueling stations, for instance. DOE has also developed advanced storage tanks for hydrogen-fueled vehicles that can store roughly three times as much hydrogen (and therefore offer three times the driving range) as conventional tanks, and has made considerable progress on advanced materials such as carbon nanotubes that will allow auto manufacturers much more flexibility in designing fuel systems than they ever have had before.

Fossil Energy R&D: Fossil fuel energy R&D programs help industry develop advanced technologies to produce and use coal, oil, and gas resources more efficiently and cleanly. Over the past eight years, federally-funded development of clean, highly-efficient gas-fired and coal-fired generating systems aimed to reduce greenhouse gas and other air-pollution emissions, while reducing electricity costs compared to currently available technologies. These programs also include efforts to discover effective, efficient, and economical means of sequestering carbon dioxide. The programs also help boost the domestic production of oil and natural gas by funding R&D projects with industry to cut exploration, development, and production costs.

Among the program's accomplishments:

- In 1999, DOE helped demonstrate a more efficient and less costly drilling and completion technology that could ultimately add six trillion cubic feet of domestic gas reserves, demonstrated four advanced oil production enhancement technologies that contributed to adding 46 million barrels of incremental domestic oil reserves, and

began full-scale component testing of two advanced, utility-scale turbines that are more efficient and less polluting than current technologies.

- In 2000, DOE's Advanced Turbine Systems effort with industry introduced the first gas turbines to exceed 60-percent efficiency when operated in combined-cycle mode—the “four minute mile” of turbine technology. When the effort began in the early 1990s, the best turbine systems had efficiencies of only about 50 percent. The new, higher efficiency can reduce operating costs by about 10 percent, saving as much as \$200 million over the life of a typical gas-fired 400–500 megawatt combined-cycle plant, while also reducing pollution and greenhouse gas emissions.

Nuclear Energy R&D: Nuclear fission power is a widely used technology, providing about 19 percent of the electric power consumed in the United States and about 17 percent worldwide without generating greenhouse gases. If fossil plants were used to produce the amount of electricity generated by these nuclear plants, more than 300 million additional metric tons of carbon would be emitted each year. Continued R&D addressing the issues that threaten the acceptance and viability of nuclear fission in the United States will help determine whether nuclear fission can continue to supply increasing amounts of economically-priced energy while reducing greenhouse gas emissions. The Administration's investments have focused on advancing future nuclear power plant designs, the safety and life-extension of existing reactors, and the safe long-term storage of spent nuclear fuel (discussed later in this chapter under Environmental Quality).

Based on the recommendations of the President's Committee of Advisors on Science and Technology (PCAST), the Nuclear Energy Research Initiative (NERI) was initiated in 1999 to improve the economics, proliferation resistance, waste management, and safety of advanced nuclear energy systems for the longer-term future. In its first two years, the NERI program has awarded a total of 56 innovative R&D projects on a competitive, peer-reviewed basis to universities, national laboratories, and industry. Other

recommendations from PCAST led to the creation of the Nuclear Energy Plant Optimization program to consult cost-shared R&D with industry to develop new technologies to manage the long-term effects of ageing and enhance the reliability and safety of existing U.S. nuclear power plants. Fifteen projects have begun in the first two years of this initiative.

Uranium Enrichment: In 1998, the Administration successfully privatized the U.S. Enrichment Corporation (USEC). The Treasury Department received about \$1.7 billion from the sale of public stock and proceeds from debt equity. This sale through a public offering was the biggest privatization since 1986. USEC was established as a Government corporation under legislation passed by the Congress in the Energy Policy Act of 1992, which placed it on a path toward privatization, based on the belief that the private sector can perform this business activity better than the Federal Government.

Environmental Quality

Environmental Management: The Non-Defense Environmental Management and Uranium Enrichment Decontamination and Decommissioning Fund programs are part of the Nation's most complex environmental cleanup program (the remainder being the Defense Environmental Management program), addressing the results of more than five decades of research and production of nuclear energy technology and materials. During this Administration, these programs reduced safety and health risks and managed radioactive and hazardous wastes to protect the environment at: (1) sites run by DOE's predecessor agencies; (2) sites contaminated by uranium and thorium production from the 1950s to the 1970s; (3) DOE's inactive uranium processing plant in Oak Ridge, Tennessee; (4) New York's defunct spent nuclear fuel reprocessing center; and, (5) the gaseous diffusion plants operated by the now-private USEC.

The successes of these activities ranged from the removal of low-level radioactive contamination at sites accessible to the public such as the Ventron site in Beverly, Massachusetts, to meeting the technical challenge of solidifying high-level radioactive waste at the

West Valley Demonstration Project vitrification facility. At the beginning of 1993, remedial action was completed at 23 of the 113 sites in the cleanup program. Through 1999, cleanup activities were completed at an additional 46 sites. In 2000, this Administration continued its focus on protecting human health and the environment by completing remediation of the King Avenue site in Columbus, Ohio, and the General Atomics facility north of San Diego, California, for a total of 48 sites cleaned up since 1993.

Radioactive Waste: DOE's Civilian Radioactive Waste Management Program was created by the Nuclear Waste Policy Act (NWPA) in 1982 to develop a geologic repository for the disposal of the Nation's spent nuclear fuel from commercial nuclear reactors and high-level radioactive waste from the nuclear weapons program.

Since 1994, the program has focused resources on completing an evaluation of the technical suitability of the Yucca Mountain candidate repository site. This effort has included construction of the Exploratory Studies Facility, a 25-foot diameter, 4.9-mile tunnel that provides direct access to the geologic formation that may house a repository block. In 1998, DOE completed a viability assessment concluding that the Yucca Mountain site remains a promising candidate for a geologic repository. It also identified areas for further investigation before a decision can be made on whether or not the site should be recommended. In July 1999, DOE issued a draft environmental impact statement for the Yucca Mountain site. It also evaluated potential impacts from the transportation of spent fuel and high-level waste to it. The Environmental Protection Agency (EPA), under the authority of the Energy Policy Act, has issued a draft site-specific radiation standard for Yucca Mountain. This regulatory framework will be complemented by NRC, which will adopt EPA's standards in its licensing regulation. DOE expects to revise its site recommendation guidelines to conform to these regulations.

DOE reached an agreement with PECO Energy Company in July 2000 to settle potential litigation over spent fuel storage costs that PECO has incurred due to the

Department's delay in commencing spent fuel acceptance. This agreement is a model for settlement negotiations with other utilities who have filed suit against the Department for failure to begin waste acceptance in 1998, as required under the NWPA.

DOE expects to complete a "Site Recommendation Consideration Report" by the end of 2000, to be followed by a Secretarial determination in 2001 on whether or not to recommend the Yucca Mountain site to the President. The report presents the technical basis for a site recommendation.

DOE Lands: During the past eight years, over 300,000 acres of land at DOE sites have been set aside as environmental reserves to preserve unique habitat and animal species permanently.

Electricity Production and Power Marketing

Power Marketing Administrations: The four Federal Power Marketing Administrations, or PMAs, (Bonneville, Southeastern, Southwestern, and Western) market electricity generated at 127 multi-purpose Federal dams and manage 33,000 miles of federally-owned transmission lines in 34 States. The PMAs sell about five percent of the Nation's electricity, primarily to preferred customers such as counties, cities, and publicly-owned utilities. The PMAs face growing challenges as the electricity industry moves toward open, competitive markets.

- Over the past eight years, each PMA has operated its transmission system to ensure that service is continuous, reliable, and balanced—that is, each PMA system achieved a "pass" rating each month (or its equivalent in past years) under the North American Electric Reliability Council performance standards. These measures are used industry-wide and indicate the reliability and quality of power provided by utilities.
- The Administration proposal to sell Alaska Power Administration assets to current customers was signed into law on November 28, 1995. The Eklutna and Snettisham projects were sold in 1998 for a cash payment of \$88 million.

- The Administration modified the purchase power and wheeling activities of Southeastern, Southwestern, and Western PMAs to phase down and eliminate Federal appropriations to support these activities after 2004. This will encourage PMA customers to assume additional responsibility for the purchase and delivery of power rather than relying on Federal PMAs.

Tennessee Valley Authority (TVA): TVA is a Federal Government corporation and one of the three largest electric power suppliers in the country. TVA produces four percent of the Nation's electric power and transmits that power over its 17,000 mile transmission network to 158 municipal utilities and rural electric cooperatives that serve eight and a half million customers in seven States.

During the past eight years, TVA has taken important steps to improve its power program's operating and financial performance:

- In 1992, TVA's nuclear power program faced tough management challenges. Two completed nuclear power units had been out of service for seven years and one unit under construction was years behind schedule. Today, TVA has turned that situation around. It currently has five nuclear units on line and they are part of an award-winning nuclear power program.
- In 1997, TVA announced its 10-Year Business Plan, a long-term financial strategy designed to ensure that the Federal power agency reduces its outstanding debt, operates on a sound financial footing, and is prepared to supply power at competitive prices when the Nation's electric power industry is restructured. Through the end of 2000, TVA has reduced its long-term debt by more than \$1.7 billion. Before 1997, TVA's debt had increased every year for 35 years.
- TVA held rates steady over the past decade with only one 5.5 percent rate increase. During the same period the cost of living increased more than 40 percent.

(For information on TVA's non-power activities, see Chapter 10, "Community and Regional Development.")

Rural Utilities Service: The Department of Agriculture's (USDA's) Rural Utilities Service (RUS) provides electrification, telecommunication, and distance learning and telemedicine grants and loans. RUS provides direct and guaranteed loans to rural electric cooperatives, public bodies, nonprofit associations, and other utilities in rural areas for generating, transmitting, and distributing electricity. Since 1993, RUS has supported construction of 97,000 miles of new or upgraded electric transmission and distribution lines, and has approved loans for over 2,500 megawatts of new electric generation capacity.

In order to provide electric service to rural areas and minimize the potential for loan defaults, RUS works with the electric service providers in meeting the demands of a changing industry. For example, in 1997, RUS assisted Oglethorpe Power Corporation (OPC) into "unbundling" operating companies into generation, transmission, and operating companies. The restructuring of OPC resulted in better and lower cost of service to OPC's consumers in Georgia and improved the security of RUS loans to OPC and its member distribution cooperatives. In addition, from 1997 to 2000, RUS's assistance in the merger of Tri-state Generation and Transmission Association and Plains Electric Generation and Transmission Cooperative, serving Arizona, New Mexico, Colorado, Wyoming, and Nebraska, prevented the need for \$340 million in RUS debt forgiveness from the Government.

In addition, RUS assists in closing the "digital divide" for rural communities that have limited access to learning, health care expertise, and telecommunications. Through RUS loans, the number of miles of fiber optic lines in rural America have more than doubled since 1993. RUS assisted in bringing first-time telephone service to the San Carlos Apache Nation in Arizona in 1999. RUS financing has also facilitated the extension of mobile wireless and broadband services to rural America. The RUS Distance Learning and Telemedicine Program, started in 1993, was designed specifically to meet the educational and health care needs of rural America by financing computer links in rural schools and hospitals to transmit educational programming and medical resources from urban areas. This program has funded 383

projects in 48 States and territories totaling \$102 million, including \$15 million for 52 projects for Native American communities. In addition, to improve access to the Internet and to further close the digital divide, the Administration's 2001 Budget proposal was enacted for RUS to provide over \$100 million in USDA assisted financing for a pilot program designed to increase the broadband access to rural communities.

Petroleum Supplies and Emergency Reserves

Strategic Petroleum Reserve (SPR): DOE maintains SPR and invests in R&D to protect against petroleum supply disruptions and reduce the environmental impacts of energy production and use. SPR was authorized in 1975, in response to the oil embargoes of the early 1970s. The Reserve now holds about 540 million barrels of crude oil in underground salt caverns at four Gulf Coast sites. SPR helps protect the economy and provide flexibility for the Nation's foreign policy in case of a severe energy supply disruption. The Government has begun to acquire royalty oil from off-shore leases and is adding 28 million barrels to SPR, the first increase since 1994.

DOE recently completed a facilities life-extension program that marked a major milestone for SPR. Most SPR facilities were constructed in the late 1970's and early 1980's and were nearing the end of their 20-year design life. Under the life-extension program, DOE redesigned and replaced critical systems and equipment that had deteriorated, ensuring that the Reserve will be able to operate as designed for the next 25 years—achieving a draw-down rate of four million barrels per day within 15 days of a Presidential determination, and maintaining that rate for at least 90 days. The improvements also have reduced SPR's operating costs by \$12–\$15 million per year.

Regional Heating-Oil Reserve: DOE created the Northeast Home Heating Oil Reserve in 2000 by exchanging oil from the Strategic Petroleum Reserve. This regional reserve will act as an emergency source of heating oil to residents in New England and the northeast in the event of a winter shortage of heating oil.

Elk Hills Privatization: On February 5, 1998, DOE concluded the largest divestiture of Federal property in history. As part of the Administration's efforts to return to the private sector those Federal functions that operate more like commercial businesses, the Elk Hills Naval Petroleum Reserve in California was sold to Occidental Petroleum for \$3.7 billion. Revenue received from the sale was deposited in the U.S. Treasury for debt reduction.

Energy Regulation

The Federal Government's regulation of energy industries is designed to protect public health, achieve environmental and energy goals, improve energy security, and promote fair and efficient interstate energy markets.

Appliance Efficiency Rules: DOE improves the Nation's use of energy resources through its appliance energy efficiency program, which specifies minimum levels of energy efficiency for major home appliances, such as water heaters, air conditioners, and refrigerators, and for commercial-scale heating and cooling components. The initial efficiency standards were established in legislation, and DOE periodically issues rules to revise those standards or to create standards for new categories of equipment. Over the last eight years, including this year, DOE will have issued seven new or revised final rules. As a result of the appliance efficiency rules that DOE administers, consumers are saving approximately \$4.6 billion annually in reduced energy costs.

Federal Energy Regulatory Commission (FERC): FERC has been at the forefront of the national effort to introduce competition into previously regulated natural gas and electric power commodity markets. Over the past eight years, the Commission's focus has been shifting from command-and-control (setting prices and service offerings for individual companies) to oversight and monitoring of regional and national markets. Early during this period, the Commission implemented Order No. 636, completing the final major step in restructuring the natural gas transportation industry by requiring natural gas pipelines to separate their sales and transportation services and allow open access to their facilities. FERC also

substantially streamlined oil pipeline rates through indexing. In 1996, the Commission began to address the generic need for more competition in electric power, issuing Order No. 888. This order required all public utilities that own, operate, or control interstate transmission facilities to offer others the same transmission service they provide themselves. Also in 1996, the Commission issued a merger policy statement, giving guidance for preparing electric merger applications and paving the way for quicker Commission response. Order No. 642, issued in November 2000, finalized the merger policy.

In 2000, FERC continued the promotion of competition in electric markets and fine-tuned aspects of natural gas transportation markets. Order No. 2000 will lead to the establishment of regional transmission organizations, providing crucial support for competition in the electric industry. Order No. 637 requires natural gas pipelines to take measures to increase the transparency and efficiency of the pipeline grid. It also temporarily removes price caps from the resale market. While undertaking these new policy directions, the Commission has steadfastly maintained its responsibility to protect consumers from potential market power abuse, applying traditional cost-based regulation as necessary. In addition, FERC has made significant accomplishments in the area of energy projects, including an alternative licensing process for hydropower projects.

DOE Corporate Management and Procurement Reform

Reducing the size of DOE was one of the Administration's "reinventing Government" goals. Because so much of DOE's work is performed by contractors, simply reducing the number of civil service employees would not have a great effect on the total effective size of the agency, so reductions in contractor employees were also sought. Over eight years, direct employment by DOE has been reduced from 13,000 full-time equivalents (FTE) to 10,200 FTE, and contractor employment has been reduced from 148,000 FTE to 101,000 FTE.

Part of the reduction in contractor FTE is attributable to better contract management at DOE, which has been an Administration management priority. Over 80 percent of DOE's budget is spent through contracts, many of them large multi-billion, long-term contracts to manage and operate facilities. The Administration has been able to get DOE to begin to use competitive, performance-based contracting procedures. Since 1994, DOE completed 28 management and operating (M&O) contracts worth more than \$40 billion. This exceeds the total number of M&O competitive contracts issued in the entire history of DOE and its predecessor agencies. In addition, in 1999, DOE created a project management office reporting to the Deputy Secretary to better plan and manage large projects. The office has implemented procedure which require programs to define cost, schedule and performance goals for all major projects. Projects that exceed or do not meet these goals are being placed on a "watch list" for monitoring by the Chief Operating Officer. These improved management practices will save millions of dollars in contract costs at DOE.

Nuclear Regulatory Commission (NRC)

NRC, an independent agency, regulates the Nation's 103 civilian nuclear reactors and 21,000 academic, medical, and industrial li-

censees, as well as the disposal of nuclear waste, in order to ensure public health and safety and to protect the environment. NRC international activities also promote adequate protection of U.S. interests in nonproliferation and the safe and secure use of nuclear materials in other countries. To meet the challenges of a restructured and deregulated electric utility industry, NRC is committed to adopting a more risk-informed and performance-based approach to regulation. This regulatory framework will focus NRC and licensee resources on the most safety-significant issues, while providing flexibility in how licensees meet NRC requirements.

While maintaining safety as its highest priority, over the past eight years, NRC has renewed the license applications for four nuclear plants providing each an additional 20 years of operation; implemented a new reactor oversight process, which focuses inspection efforts on those aspects that present the greatest risk; approved license transfers arising from the restructuring of the electric utility industry; approved two standard reactor designs and developed regulations that provide a more predictable and stable regulatory process for future reactor applications; and developed the regulatory framework necessary to review a potential DOE application to construct and operate a high level nuclear waste repository at Yucca Mountain, Nevada.